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Consistent with a child × environment model it was hypothesized that anxious solitude and the middle school transition interact to influence peer mistreatment over time. A sample of 688 children participated in peer- and self-reported behavioral nominations assessing exclusion and victimization twice yearly from the fall of third grade through the spring of seventh grade, including the transition to middle school in the fall of sixth grade. Classroom emotional support was observed yearly. Piecewise growth curve models were used to model the level and slope of peer mistreatment outcomes before, at, and after the middle school transition, and assess *child-driven*, *environment-driven*, and *child × environment effects*. Observed classroom emotional support decreased at the middle school transition. According to peer-reports, high vs. average anxious solitary children experienced greater relative improvements in exclusion and victimization at the transition (*child × environment effects*). However, in both elementary and middle school, elevated anxious solitude predicted elevated peer exclusion and victimization (*child-driven effects*). Consistent with *environment-driven effects*, peer- and self-reports indicated decreased exclusion at the transition, indicating that exclusion occurred less frequently when peer-groups were not well-established. Furthermore, peer-, but not self-, reports indicated decreased victimization at the middle school transition, although overall both reporters indicated lower levels of victimization in middle vs. elementary school. Because improvements in peer mistreatment did not correspond to

increased classroom emotional support, rearrangement of peer social structure appeared to have the biggest impact on peer mistreatment after the middle school transition.

ANXIOUS SOLITUDE AND THE MIDDLE SCHOOL TRANSITION:

A CHILD × ENVIRONMENT MODEL OF PEER EXCLUSION

AND VICTIMIZATION TRAJECTORIES

ACROSS FIVE YEARS

by

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CHAPTER I

INTRODUCTION

The influences of anxious solitude (i.e., shyness, inhibition, and solitary behavior, Gazelle & Ladd, 2003) and the transition to middle school on peer mistreatment (peer exclusion and victimization) have been investigated independently. However, it is necessary to investigate the interaction between child and environmental factors to best predict adjustment across the transition. The presence of unfamiliar peers and the social restructuring after the middle school transition require that, in order to adapt, children actively re-negotiate their relationships. This could lead to two possible effects at the middle school transition. First, social restructuring and corresponding decreases in school and classroom environmental support may lead to increased peer mistreatment, making the middle school transition stressful for children in general (Eccles et al., 1993; Simmons & Blyth, 1987). Furthermore, the transition may be particularly difficult for children high in anxious solitude who experience elevated sensitivity in response to social challenges (Gazelle & Druhen, 2009). Alternately, the process of social restructuring could also provide children with an opportunity to improve their status among peers who are not familiar with their reputational history. In particular, children high in anxious solitude may experience greater relative benefits from interacting with peers who do not know about their behavioral history of solitude (Gazelle et al., 2005). Thus, a child × environment model (Cairns, Elder, & Costello, 1996; Magnusson & Stattin, 2006;

Sameroff, 1993) will be used to investigate the interaction between anxious solitude and the middle school transition.

Child, Environment, and Child × Environment Effects Contributing to Differential Adjustment to Middle School

Individual differences in adjustment to middle school can be driven by three general processes. First, regardless of environment, individual child characteristics (e.g., anxious solitude) could lead to greater peer difficulties (*child-driven effects*). Second, differences between elementary and middle school environments could lead to average changes in peer relations difficulties (*environment-driven effects*). In addition to acting independently, *child-* and *environment-driven effects* could contribute to peer treatment in an additive manner. For example, children high vs. average in anxious solitude may experience elevated peer mistreatment, but at the middle school transition children both high and average in anxious solitude may experience parallel increases in peer mistreatment. Finally, *child × environment effects* could occur if, at the middle school transition, children high vs. average in anxious solitude experience greater (or lesser) relative change in peer mistreatment. These possibilities are not mutually exclusive. Interaction effects may be superimposed on *child-* and *environment-driven effects*.

The Middle School Environment

Middle vs. elementary schools provide very different classroom and peer contexts, which may contribute to *environment-driven* and *child × environment effects* either at the middle school transition (between the spring of fifth grade and the fall of sixth grade) or after the transition (during middle school). Structural school-level changes

such as increased numbers of students and transitions between classes may make the middle school transition stressful for students in general (Carnegie Council on Adolescent Development, 1989). Furthermore, school-level changes may coincide with decreased classroom emotional support. Emotional support encompasses negative and positive interactions, teacher sensitivity to student needs, regard for student perspectives, and behavior management (Pianta, La Paro, & Hamre, 2003). Compared to elementary teachers, middle school teachers may engage in fewer positive and more negative interactions with students. Because they see many students, middle school teachers may be less sensitive to student needs, have fewer opportunities for positive relationships with students and, despite students' increasing desires for independence (Eccles, et al., 1993), engage in less developmentally-appropriate behavior management. Such school- and classroom-level changes may make the transition difficult for children on average, but may be particularly difficult for children high in anxious solitude who experience heightened sensitivity to the social environment (Gazelle & Druhen, 2009).

However, structural changes in general, and changes to peer structure in particular, could also have positive implications. In contrast to elementary school where children interact with the same small group of peers for all or most of the day, upon entry into middle school students encounter many unfamiliar peers, requiring a restructuring of social groups and a re-negotiation of social status. Furthermore, in middle school students transition between classes, spend less time with the same small group of peers, and therefore may know each other less well. Although potentially stressful, this change could be beneficial because children have an opportunity present themselves to peers who

are unfamiliar with their reputational history. Thus, the middle school transition provides a chance for children on average to improve their social status. Furthermore, this opportunity may be particularly beneficial for children high in anxious solitude, who may have a reputation for solitude that could contribute to elevated rates of peer mistreatment (e.g., Gazelle, et al., 2005).

Peer Mistreatment and the Middle School Transition

Anxious solitude and the middle school transition may independently influence peer exclusion and victimization. However, interactions between these two factors may also influence peer mistreatment.

Peer exclusion. Peer exclusion refers to ignoring or leaving a child out of interactions. It is less direct than victimization and occurs for longer average durations (Shell & Gazelle, under review). Therefore, it is frequently associated with emotional and psychological distress (e.g., Buhs, Ladd, & Herald, 2006; Gazelle & Ladd, 2003). Evidence in support of *child-driven effects* suggests that children higher in anxious solitude are at greater risk for peer exclusion. They become excluded soon after entry into kindergarten, and experience elevated exclusion during elementary school (Gazelle & Ladd, 2003; Ladd, 2006). They may be excluded because, despite social interest, they are less likely than their peers to initiate social interaction and their frequent solitude may make them easy to ignore (Gazelle, et al., 2005).

At the transition to middle school, changes in school structure and classroom emotional support may lead to average changes in peer exclusion. In particular, a decrease in classroom emotional support may discourage student collaboration, making it

easy for children to ignore or exclude others. As a result, exclusion may increase at the middle school transition and, in the context of continuously low emotional support, remain stably high in middle school (an *environment-driven effect*). Exclusion is higher in elementary school classrooms with low vs. high emotional support (Spangler Avant, Gazelle, & Faldowski, 2011), and similar elevations may occur if middle school classrooms are less supportive. Furthermore, if decreased classroom emotional support after the middle school transition leads to overall increased exclusion, children higher in anxious solitude may experience greater relative increases in exclusion (a *child* × *environment effect*). Because these children may be particularly sensitive to social stress (Gazelle & Druhen, 2009), when placed in unsupportive middle school classrooms with polarized social groups they may be more likely than other children to be excluded. Thus, less supportive middle school environments may be particularly difficult for children high vs. average in anxious solitude.

Alternatively, exclusion may be driven by social structural processes that are affected by peer familiarity. In particular, the restructuring of social groups that occurs at the middle school transition could decrease peer exclusion on average. In elementary school, when measured yearly exclusion increased from kindergarten to fourth grade as children became better-acquainted (Gazelle & Ladd, 2003). Furthermore, when exclusion was measured in both the fall and spring from third to fifth grade, exclusion was lowest in the fall, when children knew each other less well, and increased as children became better acquainted (although this study found decreases across grades, Spangler Avant, et al., 2011). Thus, separate studies found that exclusion decreased change as a function of

familiarity both at the grade-level and classroom-level. Likewise, an increase in unfamiliar peers at both the classroom- and school-level at the middle school transition may cause decreases in exclusion. At the transition exclusion may decrease because social groups are not yet established; therefore there are few groups from whom children can be excluded. However, exclusion may increase as groups form during middle school because it functions as a mechanism to maintain established social groups. Furthermore, if children high in anxious solitude transition from elementary schools in which they experienced elevated exclusion to middle schools in which few children are initially excluded, the rearrangement of peers may lead to greater relative decreases in their exclusion (a *child × environment effect*). Children high in anxious solitude may have more success approaching and be more likely to be approached by unfamiliar (vs. familiar) peers who do not know about their reputation for solitude, particularly in a context in which groups are not well-established. Therefore, two opposite patterns of change in peer exclusion are possible at the middle school transition: one driven by a decrease in school or classroom emotional support and the other by social structure and peer familiarity.

Peer victimization. Verbal and physical victimization are often more direct and severe than exclusion, but occur less frequently (Shell & Gazelle, under review). In elementary school, children with elevated anxious solitude on average experience elevated victimization (Gazelle, 2008; Gazelle, et al., 2005). They may be the subject of victimization because peers see them as easy targets because they are frequently alone and may be less likely to stick up for themselves (Hymel, Wagner, & Butler, 1990).

Furthermore, approximately half of students who are victimized in elementary school continue to be victimized in middle school, thus victimization is relatively stable across the middle school transition (Paul & Cillessen, 2003; Simmons & Blyth, 1987). Therefore, it is likely that in elementary and middle school children higher in anxious solitude will experience elevated victimization (a *child-driven effect*).

At the middle school transition, changes to school and peer structure as well as classroom emotional climate may contribute to victimization. Some evidence indicates that victimization increases on average at school transitions (an *environment-driven effect*). For example, compared to elementary school, seventh grade students experienced elevated victimization after the transition to junior high school (Blyth, Simmons, & Bush, 1978; Simmons & Blyth, 1987). School-level factors such as being newcomers in an established social hierarchy could lead to these initial increases in victimization. Additionally, similar to exclusion, decreased classroom emotional support could result in increased victimization, particularly if teachers allow negative interactions and use ineffective behavior management strategies when victimization occurs. In such a case, children higher in anxious solitude may experience greater relative increases in victimization because increased anxiety as a result of negative environments may make them easier targets for verbal or physical aggression (a *child × environment effect*). Furthermore, children higher in anxious solitude may rely more on teacher protection from victimization and therefore experience greater increases in victimization if this support is absent. For example, in first grade, anxious solitary girls were more likely to be victimized in classrooms with negative vs. positive emotional climate (Gazelle, 2006).

Thus, decreased emotional support at the middle school transition may lead to greater relative increases in victimization for children high vs. average in anxious solitude.

However, other evidence suggests that fewer children are victimized in middle vs. elementary school (Williford, Brisson, Bender, Jenson, & Forrest-Bank, 2011). At the school-level, increased numbers of peers and frequent class changes may lead children to know each other less well. Therefore, even in classrooms with low emotional support, children may have less time or inclination to victimize others because they are less familiar with weakness used to identify victims. As with exclusion, an overall decrease in victimization at the middle school transition may have greater relative benefits for children higher in anxious solitude (a *child × environment effect*). They may benefit from peers being unfamiliar with their reputation for being alone and not immediately identify them as easy targets for victimization. For example, anxious solitary girls experienced less victimization in playgroups with unfamiliar compared to familiar peers (Gazelle, et al., 2005), and similar processes may occur in middle school. Thus, as a result of the new environment children high in anxious solitude, compared to their peers, may experience greater relative improvements in victimization.

Finally, victimization may be used to establish social hierarchies, in contrast to exclusion which may be used to maintain the groups associated with these hierarchies once they have been established. Regardless of whether victimization increases or decreases at the middle school transition, the process of establishing social hierarchies may lead to elevated victimization in early vs. later middle school. In particular, in early sixth grade victimization may be high because students use aggression to obtain social

status (Schäfer, Korn, Brodbeck, Wolke, & Schulz, 2005). However, once these hierarchies have been established, victimization may decrease.

Overall, victimization may increase at the transition as a result of decreased emotional support or decrease because children spend less time together in middle school and know each other less well. Either pattern may be amplified by anxious solitude. Furthermore, in middle school victimization may decrease once social hierarchies are established.

The Present Study

This study used a child × environment model to investigate the contributions of *child-driven*, *environment-driven,* and *child × environment effects* on anxious solitary children's peer mistreatment during the middle school transition. Participants were assessed from third through seventh grade (with a transition to middle school in the fall of sixth grade), and peer- and self-report data was collected in the fall and spring of each year. To measure environmental change, classroom emotional support was observed yearly in elementary and middle school. The influence of *child-driven*, *environment-driven*, and *child × environment effects* were evaluated using piecewise growth curve models. Furthermore, the independent and interactive influences of child sex and socioeconomic status (SES) on each type of effect were explored. It was hypothesized that children high vs. average in anxious solitude would consistently experience more peer mistreatment. In addition, analyses compared the influences of decreased environmental support (expected to increase peer mistreatment) vs. decreased peer familiarity and a rearrangement of social structure (expected to decrease peer

mistreatment) at the middle school transition. It was expected that children higher in anxious solitude would experience more extreme patterns of change at the middle school transition.

CHAPTER II

METHOD

Participants

Participants were 688 children with informed parental consent (*M* age at the outset of the study = 8.66 years, *SD* = .50) drawn from all 46 third grade classrooms in seven public elementary schools in a suburban region of the Southeastern United States. This sample represented 80% (688/856) of children in these classrooms. Girls and boys were approximately equally represented (51.5% female (*n* = 354), 48.5% male (*n* = 334)), and the sample was diverse in regard to race/ethnicity (64% European American, 22% African American, 12% Latino, and 2% Asian American). The sample was also diverse in regard to SES, with 30% of children receiving free or reduced school lunch.

Of 688 children who participated in the fall of third grade, 570 children (83%) completed behavioral nominations across at least two elementary school grades (third and fourth or third and fifth) and 412 children (60%) completed measures in all three grades. A total of 503 children (73%) had data from at least one middle school grade (sixth or seventh), and 345 children (50%) had data from both sixth and seventh grades. Across all time points (third through seventh grade), 607 children (88%) had data from at least two grades, 533 children (77%) had data from at least three grades, 426 children (62%) had data from at least four grades, and 262 (38%) had data from all five grades. Much of this attrition was due to study design. Children participated in behavioral nominations after

the initial third grade year only if their elementary school class or middle school team had one of a smaller subset of children selected to participate in more in-depth measures. All available data was used to maximize the representativeness of results by employing full maximum likelihood estimation with growth curve analysis.

Comparisons between children who had data from both elementary and middle school (i.e., "completers") vs. those who only had data from elementary school (i.e., "dropouts") were conducted to test for attrition effects. There were no significant differences between completers and dropouts in age (at the outset of the study, completers $M = 8.66$, $SD = .49$; dropouts $M = 8.68$, $SD = .52$), $t(686) = .61$, *ns*, free or reduced lunch status (completers 29%, dropouts 32%), χ^2 (2) = 1.62, *ns*, or race/ethnicity (European American (completers 62%, dropouts 60%), χ^2 (1) = .34, *ns*, African American (completers 19%, dropouts 24%), χ^2 (1) = 1.82, *ns*, Latino (completers 17%, dropouts 15%), χ^2 (1) = .19, *ns*, Asian American (completers 2%, dropouts 1%), χ^2 (1) = .65, *ns*). There were significantly more boys in the dropout vs. completer group (completers 46% male, dropouts 56% male), χ^2 (1) = 5.96, $p < .05$; however full maximum likelihood estimations of missing data limited the impact this had on results.

Participants attended elementary school from kindergarten through fifth grade, then transitioned to middle school in sixth grade. Middle schools had team-based structures in which students were taught by two to five core subject teachers, and took all core classes with students on their team. Teams ranged in size from 19 to 124 students ($M = 82$, $SD = 28$).

Measures

Classroom observations. Classroom observations were used to assess classroom environments in elementary vs. middle school. The Classroom Assessment Scoring System (CLASS) for K-3 (Pianta, et al., 2003) was used in elementary school in the fall and spring semesters of each grade. Elementary school observations were conducted at the beginning of the day during instruction by the primary teacher in any subject. In middle school, CLASS for Secondary School (Pianta, La Paro, & Hamre, 2007) was used to observe classes once per year. This was a revision of the K-3 coding system, with modifications reflecting normative developmental changes in student and teacher behavior. The systems had identical rating scales and teachers were scored on the same subscales. In middle school, students saw many teachers in the course of the day, so the science teacher from each team was selected to be observed to maximize the amount of teacher-student and peer interaction. At several schools, the same teacher taught math and science; therefore when it was not possible to observe science, math instruction was observed instead (35% of observations in sixth grade and 4% in seventh grade). It was expected that classroom emotional support in these classes would reflect emotional support in middle school classrooms in general.

For each observation, trained research assistants observed classrooms for two 20 minute intervals and rated them on a 7-point scale (with higher scores indicating more emotional support; for more details see Pianta, et al., 2003; Pianta, et al., 2007). Classroom emotional support was a composite of positive climate, negative climate (reverse scored), teacher sensitivity, regard for student perspectives, and behavior

management (Pianta, et al., 2003). Raw scores of classroom emotional support ranged from 2.2 to 6.8 (M = 5.08). Approximately 20 percent of observations at each time point were coded by two observers, and Cohen's kappas ranged from 0.70 to 1.00.

Behavioral nominations. Behavioral nominations were administered to participating children in the fall and spring of third through seventh grades in each classroom simultaneously. Nominations were read aloud to the class and then children selected classmates' names on individual rosters. Nominations were unlimited and cross-sex nominations were allowed because they result in superior psychometric properties (Foster, Bell-Dolan, & Berler, 1986; Terry & Coie, 1991). In elementary school, rosters included the names of all participating children in the class (Mean n = 16.5, range = 7 - 24). In middle school, rosters included names of participating children in the grade (Mean n = 78, range = 10 - 250); however, only within-team nominations were used. Students spent the majority of the day with teammates, and therefore they were more familiar with their behavior. In addition, children were given the opportunity to nominate themselves for each item. Nominations are adapted from previous investigations (e.g., Gazelle & Ladd, 2003) with minor changes in wording (in brackets) to reflect changes after the middle school transition. Multi-item composites were computed as detailed below.

Anxious solitude. The anxious solitude composite is comprised of three nominations: children who (1) "…act really shy around other kids. They seem to be nervous or afraid to be around other kids and they don't talk much. They often play alone at recess [at lunch they often sit alone or don't have anyone to talk to];" (2) "… watch what other kids are doing but don't join in. At recess they watch other kids playing but

they play by themselves [at lunch they watch other kids talking but don't join into the conversation];" and (3) "…are very quiet. They don't have much to say to other kids." Peer-reports of this composite demonstrated adequate reliability at each time point (α = .76 - .96) and stability between successive time points (*r*s = .56 - .95, *p*s < .01).

Exclusion. Exclusion nominations included children who (1) "…get left out when other kids are talking or playing [hanging out] together. They don't get invited to parties or chosen to be on teams or to be work partners," and (2) "…ask if they can play [hang out] and other kids say 'no' and won't let them." The composite demonstrated adequate reliability (peer-report α = .78 – .95, self-report α = .54 - .79) and stability at subsequent time points (peer-report *r* = .49 - .91, *p*s < .01, self-report *r* = .34 - .60, *p*s < .01).

Verbal victimization. A single item measured verbal victimization: children who "…get picked on and made fun of by other kids. They get teased or get called names" (peer-report stability *r* = .46 - .89, *p*s < .01, self-report stability *r* = .30 - .58, *p*s < .01).

Physical victimization. Physical victimization was identified by children who "get hit, kicked, or pushed by other kids" (peer-report stability *r* = .21 - .73, *p*s < .01, self-report stability *r* = .15 - .45, *p*s < .01). This item was not available in the fall of third grade; therefore verbal and physical victimization were analyzed separately.

CHAPTER III

RESULTS

Analytic Plan

Classroom emotional support. One explanation for changes in peer mistreatment after the middle school transition could be changes in classroom environment. Therefore, observed classroom emotional support was compared across the middle school transition. Decreased emotional support could contribute to *environment-driven* or *child × environment effects*.

Longitudinal trajectories across the middle school transition. Piecewise growth curve analyses of peer- and self-reported criterions were conducted to test *child-driven*, *environment-driven*, and *child × environment effects* using hierarchical linear modeling (HLM, Bryk & Raudenbush, 1992; Raudenbush & Bryk, 2002). In HLM growth curve analyses, within-child repeated measures (Level 1 variables, e.g., exclusion and victimization) are modeled as a function of time, taking into account both mean patterns in the sample as a whole (fixed effects) and individual child heterogeneity (variance components). The models can also account for within-child time-varying predictors (time-varying co-variates, e.g., repeated assessments of anxious solitude) and between-child stable background characteristics (Level 2 variables, e.g., sex). Growth curve models use multiple time variables (e.g., linear and quadratic time) to identify patterns of change. Therefore, an ortho-normal transformation of time variables, which

minimizes correlations between them without changing the interpretation, was used to disentangle independent time effects. Piecewise models allow growth curves to deviate from the overall trajectory in average level and slope of the outcome at a predetermined set point (entry into middle school in the fall of sixth grade).

Peers are commonly used as informants of exclusion and victimization (e.g., Gazelle, 2008; Oh et al., 2008). However, after the middle school transition the structure of peer groups changed dramatically as children had more peers across multiple classes. As a result, after the middle school transition peers made nominations from a roster of children in their grade as opposed to their elementary school class. Thus, it is possible that despite true continuity in peer mistreatment, the change in number of reporters could lead to peer-reported changes at the middle school transition. Therefore, self-reported trajectories of exclusion and victimization were modeled to examine whether similar patterns emerged.

Peer-reported nominations. Because peer nominations were measured via counts (number of nominations received), these counts were integers (whole numbers) with means close to zero (i.e., most children did not receive nominations), and created positively skewed distributions, Poisson regression modeling was employed. Poisson regression models rate of endorsement (peer nominations). For each outcome, exposure was accounted for by multiplying the number of peers who could have nominated the child by the number of items in each composite (Spangler Avant, et al., 2011). Additionally, in Poisson regression models, the variance should be equal to the mean. However, it is common for Poisson models to have variances either greater or less than

the mean (over- or under-dispersion). Failing to adjust for over- or under-dispersion could lead to errors in variance estimates, so to correct for this possibility Poisson analyses were conducted with an additional Level 1 (within-child) variance parameter (σ^2).

Self-reported nominations. Self-nominations for each item were binary: a child could receive either 1 for "yes" or 0 for "no". Exclusion was a two item composite; therefore at each time point there was the possibility of three ordinal responses (0 = "no" to both items, 1 = "yes" to one item, 2 = "yes" to both items) and ordinal growth curve analyses were used. In contrast, verbal and physical victimization were single items, therefore responses were binary and Bernoulli growth curve analyses were used. Because self-reports were ordinal or binary, they contained substantially less information than the continuous peer-reports. As a result, the statistical models for self-reports were less likely to be able to capture nuanced effects such as interactions, although these effects may have been visible in the overall trajectories. Furthermore, as a result of the differing analytic strategies, numeric outcomes (e.g., coefficients and predicted rates) cannot be directly compared across peer- and self-reports. However, the significance of effects and the overall shape of trajectories can be visually compared.

Grouped tests of predictor categories. In addition to overall trajectories (linear, quadratic, and cubic change over time) of peer mistreatment, three groups of Level1 predictor variables were investigated. These groups tested the effects of child characteristics (i.e., anxious solitude, *child-driven effects*), the environment (i.e., the middle school transition, *environment-driven effects*), and the interaction between these

effects (*child × environment effects*). Predictor variables were tested as a group, as opposed to individually, because hypotheses focused on the overall contributions of different types of effects (e.g. child vs. environment effects), rather than contributions of a single specific predictor (e.g., anxious solitude × quadratic time).

To assess whether prototypical trajectories for children with high vs. average anxious solitude differed, *child-driven effects* were tested. These included fixed effects of anxious solitude and the interaction between anxious solitude and overall linear, quadratic, and cubic time variables.

Environment-driven effects assessed deviations from the overall trajectory (linear, quadratic, and cubic time) in level and slope of each outcome at or after the middle school transition. First, "middle school transition" indicated whether the middle school transition had occurred (spring fifth and earlier = 0, fall sixth and later = 1). Significant effects indicated a discontinuous shift in the average level of an outcome at the middle school transition (between the spring of fifth grade and the fall of sixth grade). In addition, middle school linear and quadratic time terms, which were 0 in elementary school and increased during middle school, were included (e.g., for linear time: 0 = fall sixth, 1 = spring sixth, 2 = fall seventh, etc.). Significant effects of middle school linear or quadratic time indicated systemic deviations from the overall slope after the transition (i.e., in middle school).

Finally, to assess differences in prototypical trajectories at and after the middle school transition for children high vs. average in anxious solitude, *child × environment effects* were tested. These effects included interactions between anxious solitude and each

middle school variable. In addition, main effects are always included when an interaction is present (Nelder, 1977, 1994); therefore models testing *child* × *environment* "interaction" *effects* also included *child*- and *environment-driven* "main" *effects*.

Model reduction strategy. Initially, to assess the overall pattern of change for the sample as a whole, unconditional growth curve models with linear, quadratic, and cubic time terms were run. Next, to determine which variance components were necessary, a model including *child* × *environment effects*, *child*-, and *environment-driven effects* was run with all possible variance components. Non-significant variance components were individually removed from the model, from most to least complex. Finally, multivariate chi square tests were used to establish which groups of Level 1 predictors should be included for each outcome. The most complex model (including *child* × *environment effects*, *child*-, and *environment-driven effects*, and full Level 2 effects) was compared to a simpler model without *child x environment effects*. If *child* × *environment effects* were not significant, they were removed and *child*- and *environment-driven effects* were each tested separately (in the same model).

After Level 1 effects were established, Level 2 effects were reduced. In particular, to investigate the impact of between-child characteristics on peer mistreatment, two Level 2 predictors were explored: sex (0 = female, 1 = male) and SES (0 = average/high SES, no free or reduced lunch, 1 = low SES, qualified for free or reduced school lunch). Sex and SES are background characteristics, therefore are independent of *child-driven*, *environment-driven*, and *child* × *environment effects*, although they may interact with any of these effects (e.g., changes at the transition may be more extreme for boys vs. girls). In

addition, the impact of these predictors was investigated on overall trajectories, rather than specific components of time (e.g., linear or quadratic change). Multivariate chi squared tests assessed effects of Level 2 variables on "overall time" (linear, quadratic, cubic) and "middle school time" (linear, quadratic) trajectories. If the chi squared test was significant, the variable affected at least one component of change over time, and therefore was kept in the model for the group of time terms. If not significant, the Level 2 variable was removed for all time terms and the Level 2 effects on the intercept were tested separately.

Classroom Environmental Change and the Transition to Middle School

Classroom observations indicated that on average children experienced a decrease in classroom emotional support after the middle school transition (elementary: $M = 5.30$, $SD = .48$; middle: $M = 4.58$, $SD = .67$; $t\ (422) = 18.88$, $p < .001$). In addition, emotional support directly before and after the transition was compared to investigate the extent of change children experienced. The final elementary (spring fifth grade) and first middle (sixth grade) school observations were classified into low (1-3), medium (4-5), and high (6-7) emotional support (although Pianta, et al., 2003 consider 3 a medium score, no classrooms scored 2 or below at either time point). In the spring of fifth grade compared to sixth grade, 2% vs. 10% of children were in classrooms with low emotional support, 85% vs. 85% of children were in classes with average emotional support, and 13% vs. 5% in classes with high emotional support. Thus, although the majority of children were in classrooms with average emotional support both before and after the transition, in middle vs. elementary school there were significantly more children in classes with low

emotional support and fewer in classrooms with high emotional support (χ^2 (2) = 131.78, $p < .001$). Thus, many children experienced decreased classroom emotional support after the middle school transition.

Change in Anxious Solitude over Time

Average patterns of change over time in peer-reported anxious solitude were analyzed to assist in interpretation of *child-driven* and *child × environment effects* on peer mistreatment trajectories. These models indicated that on average, anxious solitude decreased over time, and at the middle school transition it decreased dramatically (see Table 1, Figure 1). For subsequent analyses, peer-reported anxious solitude was used as a within-child time-varying predictor. Peer-reported anxious solitude was used to predict both peer- and self-reported outcomes because, compared to self-reports, peer-reports of anxious solitude have more convergent and divergent validity (Spangler & Gazelle, 2009). Because anxious solitude was continuous, specific levels of anxious solitude were selected to graphically display results in Figures 2-7. In particular, it was expected that elevated anxious solitude immediately before the middle school transition would be most predictive of transition difficulties. Therefore, prototypical trajectories of predicted proportions of anxious solitude nominations were calculated for the 30 children who, in the spring of fifth grade, were closest to the 90th (high) and 50th (average) percentiles in anxious solitude. These values reflect the decrease in anxious solitude at the middle school transition, which was more extreme for children high vs. average in anxious solitude. Nonetheless, children classified as high in anxious solitude based on the spring of fifth grade had significantly higher levels of anxious solitude at all time points (all *p*'s

< .001). As a result of the change in anxious solitude at the transition, *child-driven effects* for outcome variables may also appear to change at the transition. However, models with significant *environment-driven* and *child × environment effects* indicate that there were transition-related changes in peer mistreatment over and above changes in anxious solitude.

Change in Peer Mistreatment over Time

Peer exclusion. ***Peer-reports.*** Overall, peer-reported exclusion gradually decreased in elementary school, dropped dramatically at the middle school transition, and then remained stable in middle school (see Table 2, Figure 2). The decrease at the transition suggests that exclusion is a result of group polarization and therefore decreases when children are initially unfamiliar with each other.

In particular, children high vs. average in anxious solitude experienced greater relative decreases in exclusion at the transition (*child × environment effect*, χ^2 (9) = 63.62, $p < .001$), suggesting that they experienced greater benefits from the presence of unfamiliar peers, despite elevated exclusion at all time points. Furthermore, although both boys and girls experienced a decrease at the transition, trajectories in middle school varied based on gender and level of anxious solitude. In middle school, boys high in anxious solitude experienced elevated exclusion compared to average anxious solitary boys. In addition, for all boys exclusion increased during the first two years of middle school. Thus, exclusion increased for boys as peer groups became better established. In contrast, girls' exclusion remained stable in middle school, with those high vs. average in

anxious solitude experiencing more exclusion. These patterns resulted from a sex × anxious solitude × middle school time interaction.

Child-driven effects also contributed to overall patterns of exclusion. Consistent with expectations, children higher in anxious solitude experienced elevated exclusion in both elementary and middle school. In addition, regardless of environment, children of low vs. average/high SES experienced elevated exclusion.

The middle school transition influenced overall exclusion trajectories such that exclusion decreased on average at the middle school transition (an *environment-driven effect*). Thus, the rearrangement of peer groups and unfamiliarity among peers may have decreased exclusion.

Self-reports. To confirm that *environment-driven* and *child × environment effects* resulted from changes in exclusion, rather than peer-reporters, self-reported models were also tested. The overall pattern of exclusion (a gradual decrease in elementary school, a drop at the middle school transition, then an increase in middle school) was consistent with peer-reported patterns suggesting that exclusion was strengthened by peer familiarity (see Table 3, Figure 3). However, despite overall similarities to peer-reports, multivariate tests indicated that *child × environment effects* were not significant (χ^2 (9) = 9.28, $p = ns$). This may have been due to the limited information in the ordinal self-report data, which could have hidden interaction effects. Nonetheless, through additive effects *child-* (χ^2 (12) = 60.46, $p < .001$) and *environment-driven* (χ^2 (9) = 31.22, $p < .01$) *effects* produced patterns similar to peer-reports.

Consistent with peer-reports, children high vs. average in anxious solitude reported higher levels of exclusion in both elementary and middle school (a *child-driven effect*), indicating that elevated anxious solitude put children at risk for elevated exclusion.

Also consistent with peer-reports, on average children reported decreased exclusion at the middle school transition (an *environment-driven effect*), suggesting that exclusion may be less prevalent when peer groups are not well-established. Furthermore, similar to boys' peer-reports, self-reported exclusion increased during middle school as peer-groups became better-established (although there were also unexpected differences in these patterns for children of low vs. average/high SES).

Thus, *child-* and *environment-driven effects* were supported by both peer- and self-reports. Although self-reported *child* × *environment effects* were not significant, these patterns also appeared similar to peer-reports.

Verbal victimization. ***Peer-reports.*** Overall, peer-reported verbal victimization gradually decreased in elementary school, then dropped at the middle school transition and subsequently remained stably low after the transition (see Table 4, Figure 4). Thus, changes to social structure in middle school may have decreased verbal victimization.

Consistent with expectations, transition effects differed based on child characteristics (*child* × *environment effects*, χ^2 (9) = 55.05, $p < .001$). In particular, children high vs. average in anxious solitude experienced greater relative decreases in verbal victimization at the middle school transition, although they still experienced elevated verbal victimization compared to peers. Thus, the increase in unfamiliar peers at

the middle school transition led to greater decreases in verbal victimization for children higher in anxious solitude. In addition, trajectories of verbal victimization during middle school were qualified by sex and level of anxious solitude. In middle school, boys vs. girls experienced higher and more stable verbal victimization, and boys high in anxious solitude experienced the highest verbal victimization. In contrast, girls experienced more change in peer-reported verbal victimization in middle school (a slight decrease in sixth grade and increase in seventh grade). Additionally, girls high vs. average in anxious solitude had higher levels of verbal victimization and less change over time.

Despite the presence of *child × environment effects*, *child-driven effects* appeared to have an important influence on the shape of overall trajectory. Regardless of environmental context, children high vs. average in anxious solitude experienced elevated verbal victimization (a *child-driven effect*).

The middle school transition also influenced patterns of change such that on average, verbal victimization decreased at the transition (*environment-driven effects*). Thus, the increase in unfamiliar peers decreased verbal victimization for all children. Furthermore, trajectories during middle school differed by SES. During the first two years of middle school children of low SES experienced stable decreasing verbal victimization, whereas average/high SES children experienced greater change (a slight decrease, then increase) in verbal victimization. Nonetheless, children of low vs. average/high SES experienced elevated verbal victimization at all time points.

Self-reports. Because decreases in peer-reported verbal victimization at the transition could have been due to changes in peer nominators, models were also run with

self-reports. The overall pattern for self-reported verbal victimization was a decrease over time, which leveled off around the middle school transition (significant linear and marginal quadratic time effects, see Table 5, Figure 5). In contrast to peer-reports, multivariate tests of self-reported verbal victimization indicated that *child × environment* (χ^2 (3) = .59, *p = ns*) and *environment-driven* (χ^2 (9) = 3.23, *p = ns) effects* were not significant.

Models including only *child-driven effects* indicated that, consistent with peer-reports, self-reported verbal victimization was higher for children high vs. average in anxious solitude (χ^2 (12) = 139.44, $p < .001$). Thus, regardless of environmental context, children high vs. average in anxious solitude experienced elevated verbal victimization. These effects were qualified by gender and SES; however the overall patterns were consistent with peer-reports.

Although *environment-driven effects* for self-reported verbal victimization were not significant, overall peer- and self-reported trajectories both indicated that verbal victimization occurred less in middle vs. elementary school. Because overall trajectories were consistent, it is possible the lack of information in the binary Bernoulli models of self-reported data could have hidden significant transition effects.

Overall, both reporters indicated that children higher in anxious solitude experienced elevated verbal victimization. Furthermore, despite non-significant self-reported *environment-driven effects*, peer- and self-reports both indicated decreased verbal victimization after the middle school transition.

Physical victimization. ***Peer-reports.*** Peer-reported physical victimization was relatively stable during elementary school and decreased at the middle school transition, consistent with social structural influences (see Table 6, Figure 6). Furthermore, in middle school physical victimization increased moderately during sixth grade, then decreased moderately after sixth grade. Thus, physical victimization may increase as children are establishing a social hierarchy, but decrease once it is established.

Children high vs. average in anxious solitude had higher levels of physical victimization before and after the middle school transition, but had steeper relative declines in physical victimization at the transition (*child* × *environment effects*, χ^2 (9) = 29.55, $p < .001$). Thus, consistent with expectations, the presence of unfamiliar peers had greater positive effects for children higher in anxious solitude. In addition, change in physical victimization over time in middle school was qualified by gender and SES. In middle school, boys high vs. average in anxious solitude experienced elevated physical victimization, and for boys in general physical victimization increased in sixth grade, then decreased in seventh grade. In contrast, girls showed only slight increases in physical victimization in sixth grade, and gradual decreases after the spring of sixth grade. Thus, boys vs. girls appeared to be more likely to become targets of physical victimization after the middle school transition. Similarly, children low (vs. average/high) in SES experienced steeper increases, then decreases in physical victimization, and low SES children who were high in anxious solitude experienced more extreme patterns of this change.

Although *child-driven effects* were not significant, the direction of the effect and the *child × environment effects* suggested that children higher in anxious solitude experienced elevated physical victimization. In addition, boys vs. girls experienced more physical victimization.

Models of *environment-driven effects* indicated that peer-reported physical victimization decreased at the middle school transition, consistent with expected improvements as a result of unfamiliar peers and social structural changes.

Self-reports. Because the peer-reported changes at and after the middle school transition could have been due to changes in reporters, self-reported models were also run. Over time, self-reported physical victimization decreased, although this decrease was steeper in elementary than in middle school (see Table 7, Figure 7). Furthermore, on average self-reported (like peer-reported) physical victimization increased slightly in sixth grade, then decreased during the rest of middle school. Thus, self-reports were consistent with peer-reports in suggesting that physical victimization was used to establish dominance in a new context. However, in contrast to peer-reports, multivariate tests indicated that *child × environment* (χ^2 (3) = .91, p = *ns*) and *environment-driven* (χ^2 (9) = 7.77, p = *ns*) *effects* were not significant.

Models including only *child-driven effects* indicated that, consistent with non-significant peer-reported patterns, children high vs. average in anxious solitude experienced marginally higher rates of physical victimization (χ^2 (12) = 26.84, $p < .01$). Also consistent with peer-reports, boys vs. girls reported more physical victimization across time.

Because peer-reported *environment-driven* and *child × environment effects* were not replicated, peer-reported decreases at the transition may have been a result of changes in peer nominators. However, according to both reporters, physical victimization occurred less at later time points in middle school (e.g., spring of seventh grade) vs. earlier elementary school time points (e.g., fall of third grade). Thus, there were consistent overall decreases in physical victimization, although the timing of these decreases differed. Nonetheless, after the transition self-reports, similar to peer-reports, indicated increased physical victimization early in middle school followed by later decreases (although these patterns differed for low SES children). Thus, physical victimization may have been used to establish hierarchies.

Overall peer- and self-reported *child-driven effects* were consistent. Furthermore, although self-reports did not indicate significant changes at the middle school transition, peer- and self-reports indicated consistent patterns of change in physical victimization during middle school.

CHAPTER IV

DISCUSSION

Results overall indicated that anxious solitude and the middle school transition played important, but mostly separate roles in trajectories of peer mistreatment from third to seventh grade. According to peer-reports, children high vs. average in anxious solitude experienced greater relative improvements in peer mistreatment at the middle school transition, thus experiencing greater benefits from unfamiliarity among peers. Nonetheless, children high vs. average in anxious solitude experienced more exclusion and victimization in both elementary and middle school. Finally, although classroom emotional support decreased at the middle school transition as expected, this did not correspond to an increase in peer mistreatment. Instead, at the transition exclusion decreased according to both peer- and self-reports, and victimization decreased according to peer-reports. Thus, decreases in peer mistreatment at and after the transition were driven more by social structural changes than decreased classroom emotional support.

Classroom Emotional Support and the Middle School Transition

Observational evidence indicated that, consistent with expectations, middle vs. elementary school classrooms provided less emotional support. However, this decrease in emotional support did not correspond to increased peer mistreatment. Thus, lower emotional support in middle school science and math classes was not associated with increased peer exclusion and victimization. As a result of structural changes at the

transition, children spent less time in a single classroom in middle vs. elementary school. Therefore, the presence of unfamiliar peers and the corresponding re-negotiation of relationships may have had a greater impact than classroom emotional support on changes in exclusion and victimization.

Peer Exclusion

Overall, peer- and self-reports indicated largely consistent patterns of change in exclusion. According to peers, children high vs. average in anxious solitude experienced greater relative decreases in exclusion at the middle school transition (a *child* × *environment effect*). Although this interaction effect was not significant for self-reports, there appeared to be a similar pattern in the self-reported trajectory which may have been concealed by the ordinal self-report data. Because children high vs. average in anxious solitude experienced elevated exclusion in elementary school, they may experience greater relative benefits from opportunities to establish new relationships with peers who are unfamiliar with their reputation for solitude. Furthermore, they may be more likely to approach or be approached by peers in a context in which peer groups are not well-established.

Nonetheless, according to peer- and self-reports, as expected children high vs. average in anxious solitude experienced elevated exclusion in both elementary and middle school (a *child-driven effect*). Thus, regardless of the environment, frequent solitude or infrequent social initiation as a result of elevated anxious solitude appeared to put children at risk for exclusion across childhood and early adolescence.

According to both peer- and self-reports, on average exclusion decreased at the middle school transition (an *environment-driven effect*). This suggested that exclusion was a product of group dynamics because it was lowest in the fall of sixth grade, when children were relatively unfamiliar with peers and therefore there were few established peer groups. Furthermore, exclusion increased in middle school for boys according peer-reports, and for boys and girls according to self-reports. Thus, as children spent time together peer groups became polarized, and group membership became more exclusive as a method of maintaining these social groups. These results are consistent with previous findings indicating that exclusion increased from the fall to spring within a school year, suggesting that similar processes occur within-grade (Spangler Avant, et al., 2011). Peer-reported gender differences may have occurred because girls often spend time in pairs, rather than large groups (Maccoby, 1990). Therefore, it may have been less evident to middle school peers when girls were excluded.

One finding that did not support the pattern of increased exclusion with more familiarity was the peer- and self-reported gradual decrease in exclusion over time in elementary school. By fifth grade many children had been together for up to five years (although re-arranged within classes each year) and presumably knew each other well. Therefore, if exclusion was driven by familiarity, it was expected that it would be highest at this point in time. This inconsistency may be caused by structural changes at the end of elementary school. In fifth grade, several schools (at least 40% of children) made organizational modifications such as changing classes for some or all subjects to prepare students for the middle school transition. These modifications were not formally

measured, therefore the extent to which children experienced structural changes cannot be identified. However, these relatively minor changes to the peer structure may have upset peer groups enough to decrease exclusion.

Overall, regardless of school context, children higher in anxious solitude experienced elevated peer exclusion. In addition, exclusion changed as a function of peer social structure, with decreases when groups were rearranged and increases as groups became better-established. Furthermore, at the middle school transition these patterns were more extreme for children higher in anxious solitude, indicating that they experienced greater relative benefits from peer restructuring.

Verbal Victimization

Peer- and self-reports of verbal victimization were overall relatively consistent for transition effects, and highly consistent for anxious solitude effects. According to peer-reports, children high vs. average in anxious solitude experienced greater relative decreases in verbal victimization at the middle school transition (*child × environment effects*). This is consistent with decreases due to peer restructuring as well as Gazelle and colleagues' (2005) findings that anxious solitary girls experienced less victimization with unfamiliar vs. familiar peers. In elementary school, children high in anxious solitude may have been victimized because, based on their reputation for solitude, peers expected them to be an easy target (Hymel, et al., 1990). In contrast, unfamiliar middle school peers did not have such expectations, and therefore these children experienced greater relative decreases in victimization.

However, as expected, according to both peer- and self-reports children high vs. average in anxious solitude experienced more verbal victimization in both elementary and middle school (a *child-driven effect*). Thus, anxious solitary children were at elevated risk for verbal victimization even in a context with when rates of verbal victimization were relatively low. Because middle school peers do not know their reputational history, it is unlikely that anxious solitary children were victimized in middle school based on reputation. Instead, they may have exhibited behaviors that indicated even to unfamiliar peers that they could be an easy target.

Overall patterns of peer- and self-reported verbal victimization at and after the middle school transition were relatively consistent (*environment-driven effects*). Peers reported that verbal victimization decreased at the middle school transition and remained stably low in middle school, suggesting that social restructuring and initially unfamiliar peers decreased verbal victimization. Although self-reports did not indicate significant changes in verbal victimization at the middle school transition, they were consistent with peer-reports in indicating lower rates of verbal victimization in middle vs. elementary school. Thus, the limited information in binary Bernoulli models of self-reported data may have hidden significant transition effects. Because children no longer spent class time with the same small group of peers, a lack of familiarity may have prevented children from identifying easy targets in middle school. Therefore, although the specific timing of the decrease was not replicated across reporters, results suggested that the change in peer structure and increased numbers of peers led to decreased verbal victimization after the transition.

Overall, children higher in anxious solitude were at elevated risk for verbal victimization in both elementary and middle school. Furthermore, verbal victimization occurred less on average in middle vs. elementary school, suggesting that changes to social structure provided fewer opportunities for victimization in middle school. Finally, peers reported that children higher in anxious solitude experienced steeper relative decreases in verbal victimization at the middle school transition, thus experienced greater relative benefits from the transition.

Physical Victimization

With the exception of effects at the transition, peer- and self-reports indicated consistent overall trajectories for physical victimization. Peer-reported *child* × *environment effects* indicated that children high vs. average in anxious solitude experienced greater relative decreases in physical victimization at the middle school transition. Unfamiliar middle school peers (compared to familiar elementary peers) may not immediately identify children higher in anxious solitude as easy targets because they do not know about their behavioral history of solitude (Gazelle, et al., 2005). Therefore, unfamiliar peers may lead to greater relative improvements (decreases) in victimization for children higher in anxious solitude.

In addition, children high vs. average in anxious solitude reported marginally elevated physical victimization, and peer-reported interaction effects indicated similarly elevated risk (a *child-driven effect*). Thus, across contexts children higher in anxious solitude experienced elevated physical victimization, possibly because their solitary behavior helped peers identify them as an easy target. Additionally, consistent with

previous evidence, according to both peer- and self-reports, boys vs. girls experienced more physical victimization (e.g., Hoglund, 2007; Russell, Kraus, & Ceccherini, 2010).

Peer-, but not self-reports indicated significant decreases in physical victimization at the middle school transition. This discrepancy could have occurred because physical victimization occurred outside of peer awareness in middle school. Thus, although there may have been continuity in physical victimization (consistent with self-reports), peers reported decreases because they witnessed less of this behavior. Nonetheless, peer- and self-reports were consistent in indicating that physical victimization occurred less in middle school vs. early elementary school. Overall, although it was clear that physical victimization decreased over time, inconsistencies between peer- and self-reported timing of the decrease made it difficult to identify whether this change was a result of developmentally normative decreases in physical aggression (e.g., Underwood, Beron, & Rosen, 2009) or the re-arrangement of social structures at the middle school transition.

Trajectories for both peer- and self-reports indicated deviations from the overall slope of physical victimization after the middle school transition (an *environment-driven effect*). Physical victimization increased during sixth grade, and decreased after the spring of sixth grade. Thus, consistent with expectations, physical victimization may have been used to establish social hierarchies (Schäfer, et al., 2005). Because it was a tool for establishing (rather than maintaining) hierarchy, physical victimization decreased once social groups were formed. According to peer-reports, this pattern of change was most extreme for anxious solitary boys. Boys are often victimized by both boys and girls (whereas girls are primarily victimized by other girls, Pellegrini & Long, 2002) leading to

elevated overall victimization. Therefore, they may be particularly likely to become the victims of physical aggression while dominance is being established. In addition, peers reported that children of low vs. average/high SES experienced steeper versions of this middle school trajectory (increase, then decrease). Thus, boys and children low in SES were particularly likely to become physically victimized in the process of establishing peer groups.

Overall, in both elementary and middle school children higher in anxious solitude (and boys vs. girls) experience elevated physical victimization. Physical victimization decreased over time according to both reporters, although only peers reported changes specifically at the middle school transition. Finally, children appeared to use physical victimization to establish dominance early in middle school.

Comparing Peer- and Self-reported Effects

Although peer-reports were of primary interest for this study, in middle vs. elementary school substantially more peers participated in behavioral nominations, which could have affected the rate of peer-reported nominations. In contrast, self-report methodology remained the same across elementary and middle school. Therefore, consistency between peer- and self-reports provided confidence that results reflected true changes in peer mistreatment. Although overall similar, peer- and self-reports were most consistent in identifying anxious solitary *child-driven effects*, middle school transition effects for exclusion (an *environment-driven effect*), and overall trajectories of change over time.

Nonetheless, for low SES children (who qualified for free or reduced school lunch) there were consistent discrepancies between peer- and self-reports. Low SES children self-reported trajectories very different from peer-reports and from the self-reports of average/high SES children. As a result of less supportive backgrounds, low SES children may have had unrealistic perceptions of their own peer relations or may have been more likely to give responses they thought would please researchers. Alternately, if low vs. average/high SES children had different understandings of exclusion and victimization, self-reports of average/high SES children would be most consistent with peer-reports because most peers (approximately 70%) were of average/high SES.

Contributions and Limitations

This study provided a strong and direct test of the child × environment model (Cairns, et al., 1996; Magnusson & Stattin, 2006; Sameroff, 1993), and highlighted the joint influence of child vulnerability and peer social structure in exclusion and victimization. It is among the first to observationally assess environmental changes associated with the middle school transition and confirmed that, consistent with expectations, classroom emotional support decreased at the transition. Furthermore, consistency among multiple informants allowed for confidence that changes in peer exclusion and victimization occurred as a result of environmental change, rather than a change in the quantity of peer informants. Finally, piecewise growth curve modeling provided a strong statistical tool for directly assessing middle school-related changes to overall trajectories.

Despite these strengths, there were several limitations. First, the influence of classroom emotional support on peer mistreatment across the five years was not directly tested. Middle school transition effects may have differed for children in classrooms with high vs. low emotional support. However, the multiple levels of nesting (children in classroom in grade in school) would have required a complex cross-classified piecewise model. This dataset was not large enough to support the variance components that would have been required for such a model. Second, school-level factors such as administrative policies and school structure were not measured. The lack of correspondence between changes in classroom support and changes in peer mistreatment suggested that these factors (vs. classroom environment) may have played an important role in peer mistreatment and therefore are necessary to investigate in future studies. Finally, although *environment-driven effects* based on both peer- and self-reports suggested a decrease in peer mistreatment at the middle school transition, without directly comparing children who did vs. did not make a transition it is difficult to confirm that these changes resulted directly from the transition, as opposed to normative developmental changes that may have co-occurred with the transition.

Nonetheless, these findings have important implications. First, results were positive in demonstrating that the middle school transition did not cause greater relative difficulties for children higher in anxious solitude, but rather provided them with an opportunity to improve their peer relations among unfamiliar peers. However, because their elevated peer mistreatment transferred across school contexts, results also highlight the importance of early intervention and prevention efforts for children at risk for peer

mistreatment. Second, as expected, observations indicated that middle vs. elementary school classrooms provided less emotional support. Although the decrease in emotional support did not correspond to increased peer mistreatment, it may have had negative impacts in other areas of well-being (e.g., classroom engagement). Decreased classroom emotional support is particularly problematic in middle school because early adolescents need positive classroom environments in which teachers support their developmental need for independence (Eccles, et al., 1993). Finally, results suggest that changes in peer mistreatment after the transition may be the result of social structural and school- (rather than classroom-) level changes. In particular, the re-structuring of peer social groups and the exposure to new peers on average provided children with an opportunity to form more positive peer relations. Thus, this study provided a nuanced investigation of the influences of anxious solitude and the middle school transition on early adolescents' exclusion and victimization.

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APPENDIX A.

TABLES AND FIGURES

Table 1

Unconditional anxious solitude Poisson growth curve models

	Unconditional Time Trajectory			Final Model		
Fixed effect	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*
Overall intercept, $\beta_{0,0}$	-2.92	0.05	-59.71 ***	-2.71	0.21	-12.99 ***
Linear change, $\beta_{1,0}$	-5.03	0.15	-32.83 ***	-6.37	1.51	-4.22 ***
Quadratic change, $\beta_{2,0}$	0.06	0.08	0.79	-0.85	0.57	-1.49
Cubic change, $\beta_{3,0}$	0.04	0.05	0.81	-0.58	0.21	-2.77 **
Middle school transition, $\beta_{4,0}$				-0.69	0.11	-6.12 ***
Middle school linear change, $\beta_{5,0}$				2.39	1.09	2.20 *
Middle school quadratic change, $\beta_{6,0}$				0.27	0.12	2.20 *
Random effects	Variance		χ^2	Variance		χ^2
Overall intercept, τ_{00}	1.09		5022.90 ***	2.45		1119.36 ***
Linear change, τ_{11}	6.17		1933.50 ***	67.13		623.71 ***
Quadratic change, τ_{22}	1.52		1202.87 ***	6.12		579.80 ***
Cubic change, τ_{33}	0.29		621.63 *	0.42		481.40 *
Middle school transition, τ_{44}				2.04		754.51 ***
Middle school linear change, τ_{55}				22.71		558.17 ***
Level 1 error, σ^2	1.39			1.01		

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$.

Table 2

Peer-reported exclusion hierarchical Poisson growth curve models

	Unconditional Time Trajectory			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-2.75	0.05	-60.73	-3.84	0.35	-11.10 ***	
Linear change, $\beta_{1,0}$	-4.45	0.14	-32.07	1.40	2.50	0.56	
Quadratic change, $\beta_{2,0}$	0.16	0.07	2.45	1.80	0.93	1.93 †	
Cubic change, $\beta_{3,0}$	0.15	0.05	2.88	0.52	0.33	1.57	
Anxious solitude (AS), $\beta_{4,0}$				5.04	1.68	3.01 **	
AS × linear change, $\beta_{5,0}$				-0.84	11.84	-0.07	
AS × quadratic change, $\beta_{6,0}$				-1.19	4.57	-0.26	
AS × cubic change, $\beta_{7,0}$				0.38	1.58	0.24	
Middle school transition, $\beta_{8,0}$				-1.02	0.17	-5.87 ***	
Middle school linear change, $\beta_{9,0}$				-2.61	1.80	-1.45	
Middle school quadratic change, $\beta_{10,0}$				-0.30	0.19	-1.60	
AS × middle school transition, $\beta_{11,0}$				6.58	1.53	4.29 ***	
AS × middle school linear change, $\beta_{12,0}$				-0.69	8.78	-0.08	
AS × middle school quadratic change, $\beta_{13,0}$				-0.75	1.04	-0.72	
Level 2							
Child sex, $\beta_{0,1}$				0.70	0.40	1.76 †	
Sex × linear change, $\beta_{1,1}$				-4.64	2.91	-1.60	
Sex × quadratic change, $\beta_{2,1}$				-1.84	1.08	-1.70 †	
Sex × cubic change, $\beta_{3,1}$				0.69	0.40	1.73 †	
Sex × AS, $\beta_{4,1}$				0.13	0.47	0.27	
Sex × middle school transition, $\beta_{8,1}$				0.41	0.23	1.76 †	
Sex × middle school linear change, $\beta_{9,1}$				3.37	2.10	1.61	
Sex × middle school quadratic change, $\beta_{10,1}$				0.30	0.23	1.28	
Sex × AS × middle school transition, $\beta_{11,1}$				-0.56	2.29	-0.24	
Sex × AS × middle school linear change, $\beta_{12,1}$				0.86	2.26	0.38	$\chi^2(2) = 20.61$***
Sex × AS × middle school quadratic change, $\beta_{13,1}$				2.22	0.57	3.88 ***	
Socioeconomic status (SES), $\beta_{0,2}$				0.18	0.05	3.41 **	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests indicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 2 (cont.)

Peer-reported exclusion hierarchical Poisson growth curve models

	Unconditional Time Trajectory		Final Model	
Random effects	Variance	χ^2	Variance	χ^2
Overall intercept, τ_{00}	0.89	3807.57	0.68	1140.46 ***
Linear change, τ_{11}	4.71	1525.93	9.77	717.16 ***
Quadratic change, τ_{22}	0.81	877.09	0.32	528.34 *
Cubic change, τ_{33}	0.38	741.97		
AS, τ_{44}			4.51	837.01 ***
Middle school transition, τ_{88}			1.30	693.89 ***
Level 1 error, σ^2	1.27		1.00	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 3

Self-reported exclusion hierarchical ordinal growth curve models

	Unconditional Time Trajectory			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-3.65	0.11	-33.85 ***	-2.97	0.36	-8.19 ***	
Linear change, $\beta_{1,0}$	-2.09	0.21	-10.15 ***	2.01	1.39	1.44	
Quadratic change, $\beta_{2,0}$	0.32	0.16	2.02 *	3.51	0.97	3.61 **	
Cubic change, $\beta_{3,0}$	0.35	0.13	2.72 **	1.55	0.41	3.83 ***	
Anxious solitude (AS), $\beta_{4,0}$				6.14	0.99	6.18 ***	
AS × linear change, $\beta_{5,0}$				11.09	2.93	3.79 ***	
AS × quadratic change, $\beta_{6,0}$				2.34	1.73	1.35	
AS × cubic change, $\beta_{7,0}$				0.54	1.26	0.43	
Middle school transition, $\beta_{8,0}$				-2.35	0.87	-2.71 **	
Middle school linear change, $\beta_{9,0}$				-3.40	1.09	-3.11 **	
Middle school quadratic change, $\beta_{10,0}$				-1.13	0.28	-3.97 ***	
Threshold for high versus moderate exclusion, δ_1	1.48	0.06	23.26 ***	1.53	0.07	23.27 ***	
Level 2							
Child sex, $\beta_{0,1}$				-0.19	0.07	-2.74 **	
Socioeconomic status (SES), $\beta_{0,2}$				-2.43	1.00	-2.44 *	
SES × linear change, $\beta_{1,2}$				-10.32	4.00	-2.58 *	
SES × quadratic change, $\beta_{2,2}$				-6.72	2.69	-2.50 *	
SES × cubic change, $\beta_{3,2}$				-2.05	0.97	-2.11 *	
SES × middle school transition, $\beta_{8,2}$				5.64	2.42	2.33 *	
SES × middle school linear change, $\beta_{9,2}$				6.46	3.13	2.06 *	$\chi^2(2) = 5.47$†
SES × middle school quadratic change, $_{10,2}$				1.40	0.60	2.34 *	
Random effects	Variance		χ^2	Variance		χ^2	
Overall intercept, τ_{00}	1.80		1864.57 ***	1.74		1755.70 ***	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 4

Peer-reported verbal victimization hierarchical Poisson growth curve models

	Unconditional Time Trajectory			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-2.72	0.05	-53.55 ***	-3.34	0.42	-7.97 ***	
Linear change, $\beta_{1,0}$	-4.13	0.16	-25.97 ***	-2.94	3.02	-0.97	
Quadratic change, $\beta_{2,0}$	0.06	0.08	0.78	0.23	1.12	0.21	
Cubic change, $\beta_{3,0}$	0.26	0.06	4.48 ***	0.08	0.42	0.20	
Anxious solitude (AS), $\beta_{4,0}$				5.42	2.05	2.64 **	
AS × linear change, $\beta_{5,0}$				-5.15	14.51	-0.36	
AS × quadratic change, $\beta_{6,0}$				-2.11	5.49	-0.38	
AS × cubic change, $\beta_{7,0}$				-0.75	2.15	-0.35	
Middle school transition, $\beta_{8,0}$				-0.76	0.23	-3.34 **	
Middle school linear change, $\beta_{9,0}$				0.27	2.16	0.13	
Middle school quadratic change, $\beta_{10,0}$				0.13	0.25	0.53	
AS × middle school transition, $\beta_{11,0}$				7.64	1.71	4.46 ***	
AS × middle school linear change, $\beta_{12,0}$				5.53	11.49	0.48	
AS × middle school quadratic change, $\beta_{13,0}$				-1.97	1.44	-1.36	
Level 2							
Child sex, $\beta_{0,1}$				0.60	0.48	1.25	
Sex × linear change, $\beta_{1,1}$				-2.97	3.41	-0.87	
Sex × quadratic change, $\beta_{2,1}$				-1.44	1.26	-1.14	
Sex × cubic change, $\beta_{3,1}$				-0.53	0.46	-1.15	
Sex × AS, $\beta_{4,1}$				0.51	0.59	0.87	
Sex × middle school transition, $\beta_{8,1}$				0.27	0.27	0.98	
Sex × middle school linear change, $\beta_{9,1}$				2.61	2.43	1.08	
Sex × middle school quadratic change, $\beta_{10,1}$				0.21	0.28	0.74	
Sex × AS × middle school transition, $\beta_{11,1}$				-2.15	2.05	-1.05	
Sex × AS × middle school linear change, $\beta_{12,1}$				1.83	3.24	0.57	$\chi^2(2) = 5.69$†
Sex × AS × middle school quadratic change, $\beta_{13,1}$				1.97	0.83	2.37 *	
Socioeconomic status (SES), $\beta_{0,2}$				-0.03	0.34	-0.09	
SES × linear change, $\beta_{1,2}$				3.30	2.43	1.36	
SES × quadratic change, $\beta_{2,2}$				0.80	0.90	0.88	
SES × cubic change, $\beta_{3,2}$				0.39	0.34	1.14	
SES × AS, $\beta_{4,2}$				-0.99	0.54	-1.82 †	
SES × middle school transition, $\beta_{8,2}$				-0.24	0.21	-1.15	
SES × middle school linear change, $\beta_{9,2}$				-1.95	1.73	-1.13	
SES × middle school quadratic change, $\beta_{10,2}$				-0.31	0.21	-1.51	
SES × AS × middle school transition, $\beta_{11,2}$				-0.75	0.96	-0.78	
SES × AS × middle school linear change, $\beta_{12,2}$				-0.31	1.64	-0.19	$\chi^2(2) = 6.97$*
SES × AS × middle school quadratic change, $\beta_{13,2}$				1.56	0.46	3.41 **	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 4 (cont.)

Peer-reported verbal victimization hierarchical Poisson growth curve models

	Unconditional Time Trajectory		Final Model	
Random effects	Variance	χ^2	Variance	χ^2
Overall intercept, τ_{00}	1.09	3172.17 ***	1.09	1161.33 ***
Linear change, τ_{11}	6.35	1393.80 ***	20.08	733.46 ***
Quadratic change, τ_{22}	1.18	940.61 ***	0.64	552.85 ***
Cubic change, τ_{33}	0.43	656.77 **	0.74	565.64 ***
AS, τ_{44}			7.31	675.79 ***
Middle school transition, τ_{88}			2.11	669.64 ***
Level 1 error, σ^2	0.92		0.67	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 5

Self-reported verbal victimization hierarchical Bernoulli growth curve models

	Unconditional Time			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-2.34	0.10	-23.61 ***	-2.55	0.12	-21.92 ***	
Linear change, $\beta_{1,0}$	-1.52	0.13	-11.99 ***	-1.52	0.18	-8.37 ***	
Quadratic change, $\beta_{2,0}$	0.01	0.13	0.10	0.30	0.18	1.68 †	
Cubic change, $\beta_{3,0}$	0.22	0.15	1.44	0.18	0.20	0.91	
Anxious solitude (AS), $\beta_{4,0}$				5.47	0.62	8.84 ***	
AS × linear change, $\beta_{5,0}$				14.13	1.98	7.15 ***	
AS × quadratic change, $\beta_{6,0}$				4.06	1.97	2.06 *	
AS × cubic change, $\beta_{7,0}$				0.14	2.33	0.06	
Level 2							
Child sex, $\beta_{0,1}$				-0.06	0.09	-0.66	
Sex × linear change, $\beta_{1,1}$				0.66	0.14	4.65 ***	$\chi^2(3) = 23.08$***
Sex × quadratic change, $\beta_{2,1}$				0.03	0.14	0.19	
Sex × cubic change, $\beta_{3,1}$				-0.03	0.15	-0.17 †	
Sex × AS, $\beta_{4,1}$				1.15	0.56	2.03 *	
Socioeconomic status (SES), $\beta_{0,2}$				0.04	0.14	0.30	
SES × linear change, $\beta_{1,2}$				-0.96	0.27	-3.53 **	$\chi^2(3) = 20.34$***
SES × quadratic change, $\beta_{2,2}$				-1.01	0.29	-3.49 **	
SES × cubic change, $\beta_{3,2}$				-0.10	0.27	-0.38	
Random effects	Variance		χ^2	Variance		χ^2	
Overall intercept, τ_{00}	1.66		1726.54 ***	1.66		1686.55 ***	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 6

Peer-reported physical victimization hierarchical Poisson growth curve models

	Unconditional Time Trajectory			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-2.91	0.06	-50.26 ***	-3.88	0.70	-5.55 ***	
Linear change, $\beta_{1,0}$	-4.38	0.20	-22.30 **	-1.12	4.68	-0.24	
Quadratic change, $\beta_{2,0}$	-0.60	0.12	-5.05 ***	0.54	1.63	0.33	
Cubic change, $\beta_{3,0}$	0.68	0.10	6.50 ***	0.83	0.86	0.96	
Anxious solitude (AS), $\beta_{4,0}$				0.11	5.23	0.02	
AS × linear change, $\beta_{5,0}$				24.46	35.14	0.70	
AS × quadratic change, $\beta_{6,0}$				11.21	11.98	0.94	
AS × cubic change, $\beta_{7,0}$				3.94	6.19	0.64	
Middle school transition, $\beta_{8,0}$				-0.93	0.27	-3.50 **	
Middle school linear change, $\beta_{9,0}$				-1.52	3.42	-0.44	
Middle school quadratic change, $\beta_{10,0}$				-0.26	0.44	-0.59	
AS × middle school transition, $\beta_{11,0}$				5.34	1.73	3.09 **	
AS × middle school linear change, $\beta_{12,0}$				-18.61	26.29	-0.71	
AS × middle school quadratic change, $\beta_{13,0}$				-7.21	3.46	-2.08 *	
Level 2							
Child sex, $\beta_{0,1}$				1.84	0.93	1.99 *	
Sex × linear change, $\beta_{1,1}$				-8.87	6.21	-1.43	
Sex × quadratic change, $\beta_{2,1}$				-3.62	2.16	-1.68 †	
Sex × cubic change, $\beta_{3,1}$				-2.00	1.13	-1.78 †	
Sex × AS, $\beta_{4,1}$				-0.34	0.65	-0.52	
Sex × middle school transition, $\beta_{8,1}$				0.27	0.33	0.82	
Sex × middle school linear change, $\beta_{9,1}$				7.64	4.53	1.69 †	
Sex × middle school quadratic change, $\beta_{10,1}$				0.71	0.56	1.27	
Sex × AS × middle school transition, $\beta_{11,1}$				0.36	2.48	0.15	
Sex × AS × middle school linear change, $\beta_{12,1}$				-0.99	4.51	-0.22	$\chi^2(2) = 12.22$**
Sex × AS × middle school quadratic change, $\beta_{13,1}$				5.52	1.58	3.50 **	
Socioeconomic status (SES), $\beta_{0,2}$				-0.30	0.78	-0.39	
SES × linear change, $\beta_{1,2}$				4.33	5.21	0.83	
SES × quadratic change, $\beta_{2,2}$				1.13	1.81	0.63	
SES × cubic change, $\beta_{3,2}$				0.83	0.95	0.88	
SES × AS, $\beta_{4,2}$				-0.92	0.51	-1.79 †	
SES × middle school transition, $\beta_{8,2}$				-0.21	0.23	-0.89	
SES × middle school linear change, $\beta_{9,2}$				-2.80	3.80	-0.74	
SES × middle school quadratic change, $\beta_{10,2}$				-0.53	0.46	-1.13	
SES × AS × middle school transition, $\beta_{11,2}$				-0.73	1.11	-0.66	
SES × AS × middle school linear change, $\beta_{12,2}$				0.41	2.12	0.19	$\chi^2(2) = 7.16$*
SES × AS × middle school quadratic change, $\beta_{13,2}$				2.20	0.82	2.67 **	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 6 (cont.)

Peer-reported physical victimization hierarchical Poisson growth curve models

	Unconditional Time Trajectory		Final Model	
Random effects	Variance	χ^2	Variance	χ^2
Overall intercept, τ_{00}	0.76	915.92 ***	1.05	504.40 ***
Linear change, τ_{11}	7.78	781.81 ***	23.49	512.95 ***
Quadratic change, τ_{22}	3.38	851.97 ***	4.93	468.50 ***
Cubic change, τ_{33}	2.07	759.73 ***	5.28	497.11 ***
AS, τ_{44}			3.96	482.26 ***
Middle school transition, τ_{88}			3.71	469.46 ***
Level 1 error, σ^2	0.83		0.60	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

Table 7

Self-reported physical victimization hierarchical Bernoulli growth curve models

	Unconditional Time Trajectory			Final Model			
Fixed effects	Coefficient	*SE*	*t*	Coefficient	*SE*	*t*	
Level 1							
Overall intercept, $\beta_{0,0}$	-1.94	0.08	-25.87 ***	-2.44	0.13	-19.07 ***	
Linear change, $\beta_{1,0}$	-1.95	0.21	-9.48 ***	-2.60	0.32	-8.22 ***	
Quadratic change, $\beta_{2,0}$	0.40	0.20	1.95 †	0.88	0.30	2.91 **	
Cubic change, $\beta_{3,0}$	-0.08	0.20	-0.42	-0.53	0.34	-1.56	
Anxious solitude (AS), $\beta_{4,0}$				1.95	1.01	1.94 †	
AS × linear change, $\beta_{5,0}$				10.44	2.97	3.51 **	
AS × quadratic change, $\beta_{6,0}$				-1.95	2.85	-0.69	
AS × cubic change, $\beta_{7,0}$				0.61	3.17	0.19	
Level 2							
Child sex, $\beta_{0,1}$				0.23	0.09	2.49 *	
Sex × linear change, $\beta_{1,1}$				0.99	0.22	4.52 ***	$\chi^2(3) = 29.77$***
Sex × quadratic change, $\beta_{2,1}$				-0.29	0.23	-1.23	
Sex × cubic change, $\beta_{3,1}$				0.09	0.25	0.34	
Socioeconomic status (SES), $\beta_{0,2}$				-0.09	0.16	-0.52	
SES × linear change, $\beta_{1,2}$				-0.07	0.37	-0.19	$\chi^2(3) = 9.97$*
SES × quadratic change, $\beta_{2,2}$				-0.51	0.35	-1.47	
SES × cubic change, $\beta_{3,2}$				0.96	0.44	2.18 *	
Random effects	Variance		χ^2	Variance		χ^2	
Overall intercept, τ_{00}	1.38		1326.34 ***	1.41		1329.15 ***	

Note. $N = 688$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. χ^2 tests idicate that the Level 2 variable had significant effects on "overall time" or "middle school time".

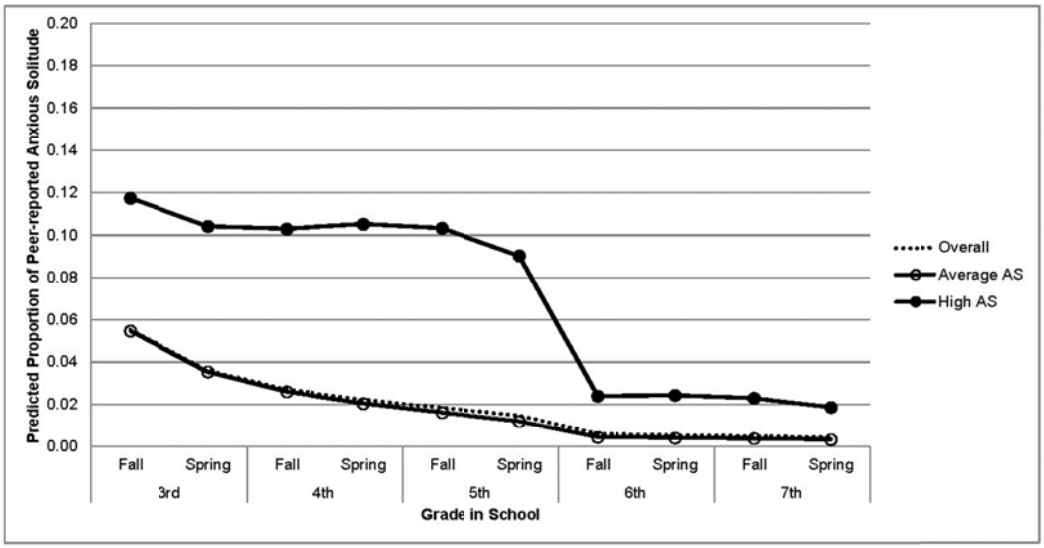

Figure 1. Trajectories of predicted proportion of peer-reported anxious solitude for third to seventh grade. This figure corresponds to Table 1. The predicted proportion is the proportion of children in an elementary class or middle school team who nominated a child for anxious solitude. AS = anxious solitude. Overall trajectory is predicted by the coefficients listed in Table 1. Average AS is the trajectory for children who score at approximately the 50th precentile of anxious solitude in the spring of fifth grade. High AS is the trajectory for children who score at approximately the 90th percentile of anxious solitude in the spring of fifth grade.

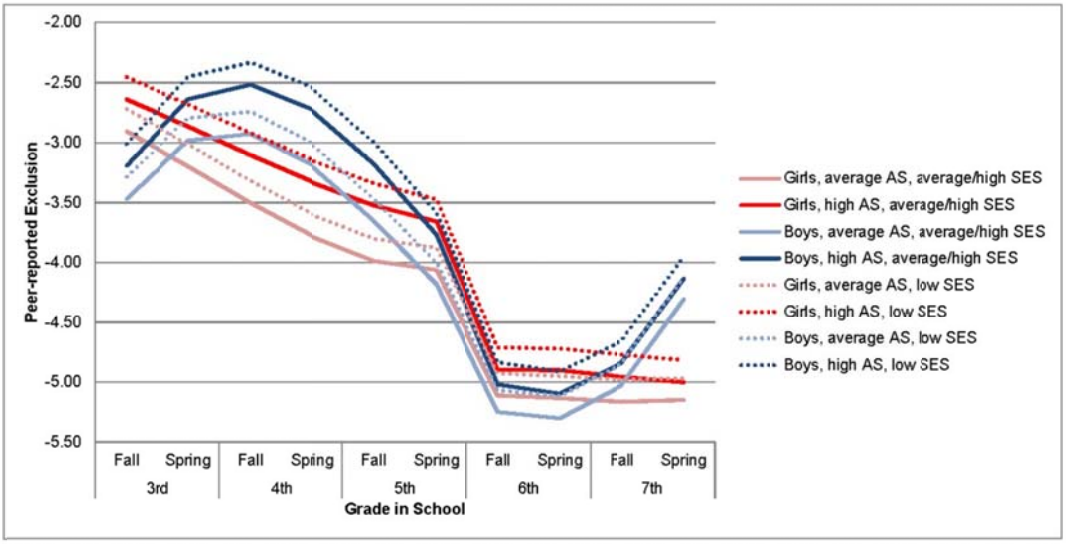

Figure 2. Trajectories of peer-reported exclusion for third to seventh grade by anxious solitude, sex, and socioeconomic status (child × environment, child-driven, and environment-driven effects). This figure corresponds to Table 2. Peer-reported exclusion is the predicted Poisson rate of peer exclusion. AS = anxious solitude. Average AS is the average trajectory for children who score at approximately the 50th precentile of peer-reported anxious solitude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.

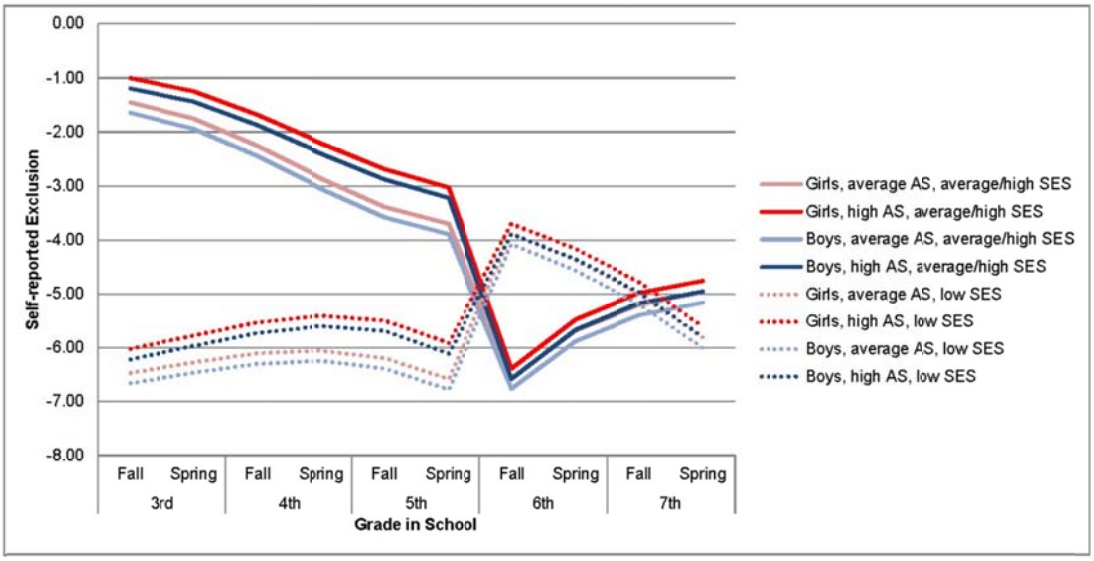

Figure 3. Trajectories of self-reported exclusion for third to seventh grade by anxious solitude, sex, and socioeconomic status (child- and environment-driven effects). This figure corresponds to Table 3. Self-reported exclusion is the predicted ordinal rate of peer exclusion. AS = anxious solitude. Average AS is the average trajectory for children who score at approximately the 50th precentile of peer-reported anxious solitude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.

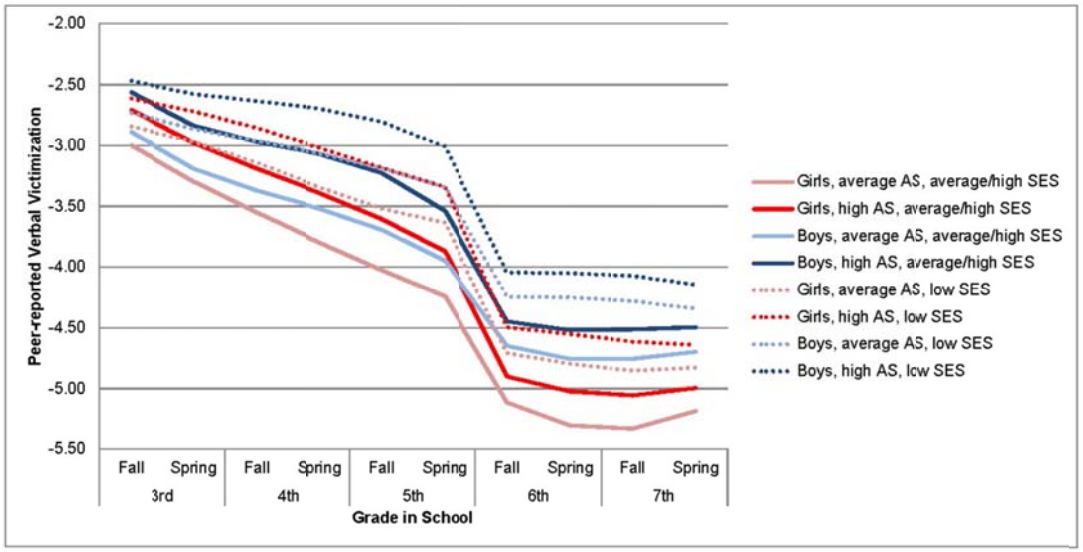

Figure 4. Trajectories of peer-reported verbal victimization for third to seventh grade by anxious solitude, sex, and socioeconomic status (child × environment, child-driven, and environment-driven effects). This figure corresponds to Table 4. Peer-reported verbal victimization is the predicted Poisson rate of verbal victimization. AS = anxious solitude. Average AS is the average trajectory for children who score at approximately the 50th precentile of peer-reported anxious solitude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.

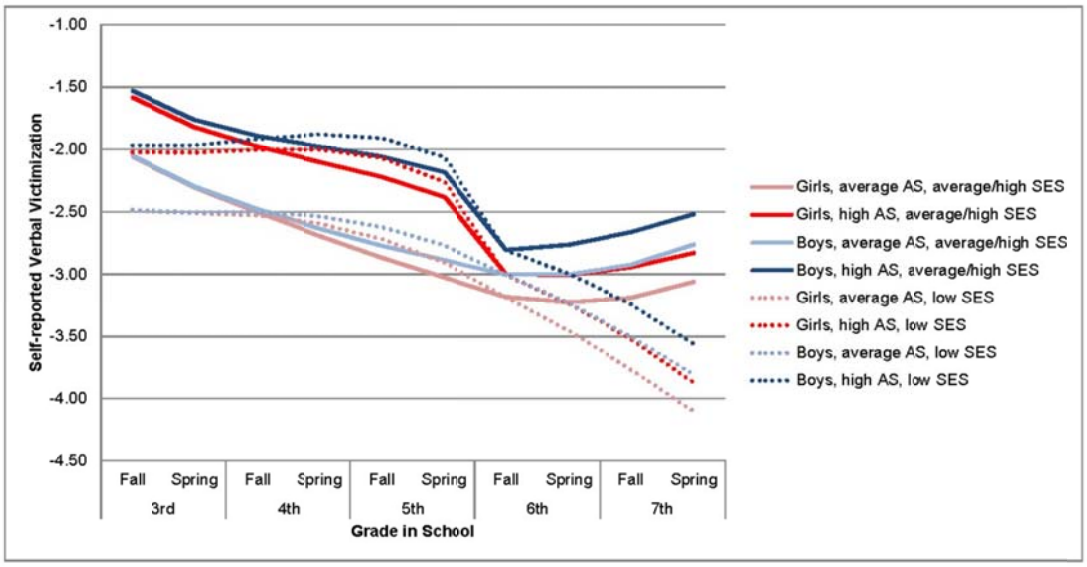

Figure 5. Trajectories of self-reported verbal victimization for third to seventh grade by anxious solitude, sex, and socioeconomic status (child-driven effects). This figure corresponds to Table 5. Self-reported verbal victimization is the predicted Bernoulli rate of verbal victimization. AS = anxious soltude. Average AS is the average trajectory for children who score at approximately the 50 th precentile of peer-reported anxious solitude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.

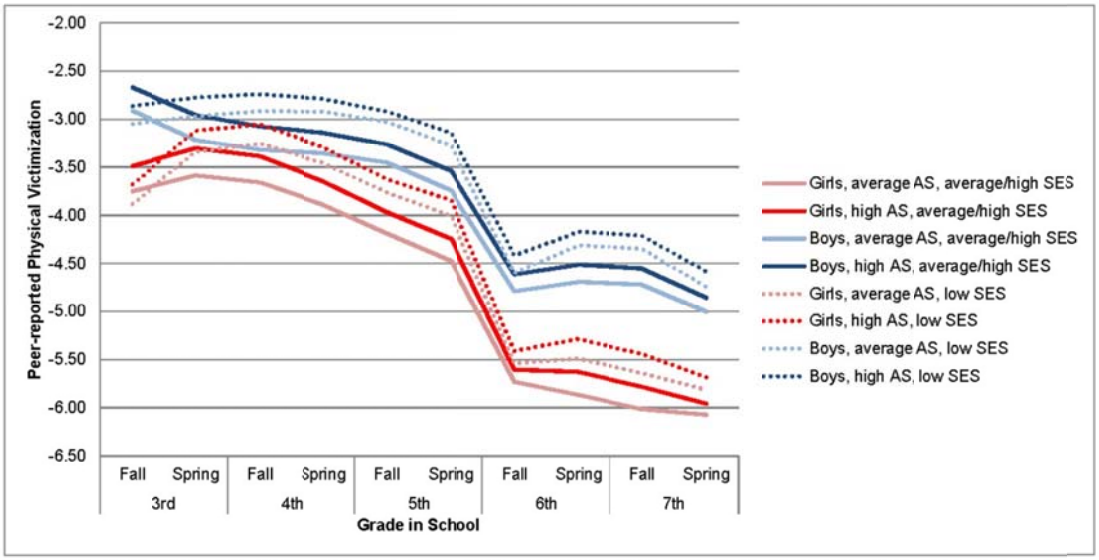

Figure 6. Trajectories of peer-reported physical victimization for third to seventh grade by anxious solitude, sex, and socioeconomic status (child × environment, child-driven, and environment-driven effects). This figure corresponds to Table 6. Peer-reported physical victimization is the predicted Poisson rate of physical victimization. AS = anxious solitude. Average AS is the average trajectory for children who score at approximately the 50th precentile of peer-reported anxious solitude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.

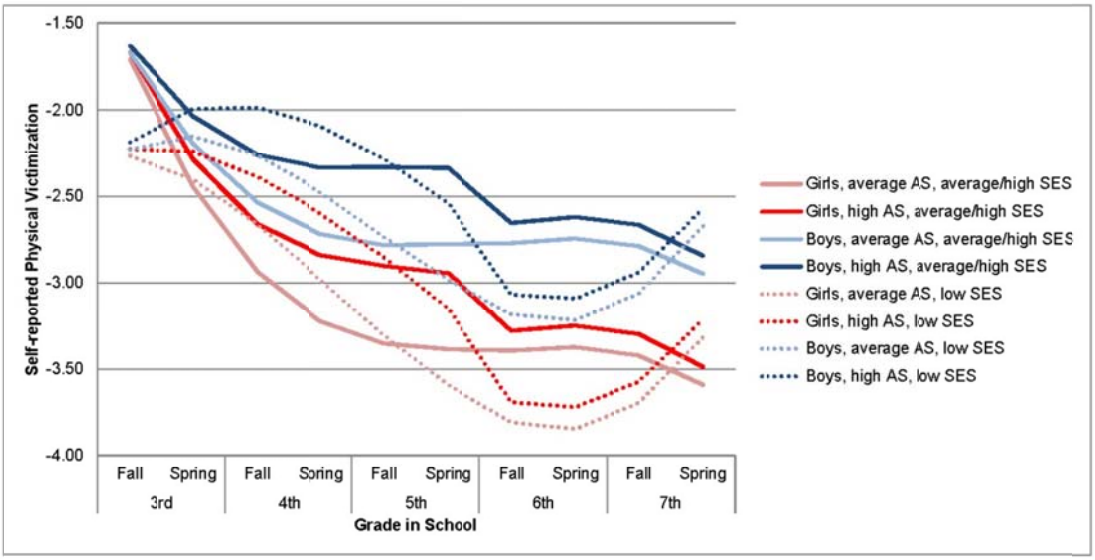

Figure 7. Trajectories of self-reported physical victimization for third to seventh grade by anxious solitude, sex, and socioeconomic status (child-driven effects). This figure corresponds to Table 7. Self-reported physical victimization is the predicted Bernoulli rate of physical victimization. AS = anxious solitude. Average AS is the average trajectory for children who score at approximately the 50th precentile of peer-reported anxious soltude in the spring of fifth grade. High AS is the average trajectory for children who score at approximately the 90th percentile of peer-reported anxious solitude in the spring of fifth grade. SES = socioeconomic status. Low SES is the average trajectory for children who qualified for free or reduced school lunch.